ANSWER MANITOU

PRECISION SUSPENSION FORKS

OWNERS MANUAL

ANSWER MANITOU 4

ANSWER MANITOU MAGNUM

ANSWER MANITOU COMP

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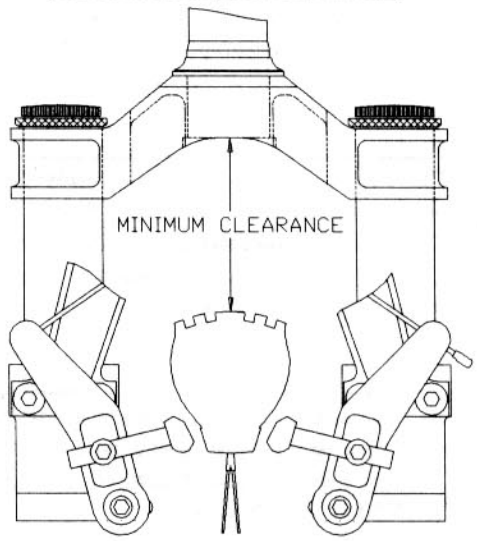
IMPORTANT: When installing wheel or any new tire be sure to check the minimum tire clearance per the table in figure 3. Measure from the highest point on the tire to the bottom of the crown.

WARNING: Do not raise or lower the fork tubes in the crown. This could cause lack of proper tire clearance when the fork compresses or reduce the amount of adjuster engagement in the leg. Either case constitutes an unsafe condition that may cause rider injury.

FIGURE 3: TIRE CLEARANCE

FORK MODEL	MIN CLEARANCE
MANITOU 4	2 3/8" (60.3)
MAGNUM	2 1/8" (54MM)
COMP	2" (50.8MM)



SPARE PARTS

Tables 1&2

Spare parts can be ordered through your dealer. If you have any problems that you cannot resolve with your dealer, you may call Answer Products customer service at (805) 257-4411, 8:00 AM to 5:00 PM Monday through Friday. **NOTE: ELASTOMER SPARE PARTS APPEAR IN TABLES 2 AND 3 ON PAGE 10.**

TABLE 1: SPARE PARTS

PART NAME	PART NUMBER
BRAKE ARCH, M4	040408
BRAKE ARCH, MAGNUM & COMP	040794
BRAKE ARCH SCREW	040452
BRAKE POST, ALL FORKS	040442
BRAKE POST SPACER, ALL FORKS	040726
CROWN PINCH BOLTS (6MMx25MM), ALL	040809
INNER LEG, M4	040549
INNER LEG, MAGNUM	040781
INNER LEG, COMP	040780
COMPRESSION ROD, ALL FORKS	040632
COMPRESSION ROD SCREW, ALL	040644
2ND & 3RD STAGE ELASTOMER CLIP, M4	040634
ALUMINUM SKEWER, M4	040625
DUST SEAL RETAINING RING, ALL FORKS	040640
DUST SEAL, ALL FORKS	040166
DUST SEAL COVER, MAGNUM & COMP	040647
BUSHING UPPER, ALL FORKS	040155
BUSHING LOWER, ALL FORKS	040154
ADJUSTER CLIP, MAGNUM & COMP	040808
ADJUSTER BODY, MAGNUM & COMP	040807
ADJUSTER CAP, MAGNUM & COMP	040806
ADJUSTER KNOB, REPLACEMENT M4	040871
ADJUSTER ASSEMBLY, REPLACEMENT M4	040872
OWNERS MANUAL, 95 FORKS	040840
FORK BOOTS, CLEAR 93 & SUBS. FORKS	85-3508
FORK BOOTS, BLACK 93 & SUBS. FORKS	85-3509
FORK BOOTS, BLUE 93 & SUBS. FORKS	85-3523

ADJUSTER ASSEMBLY (040872)

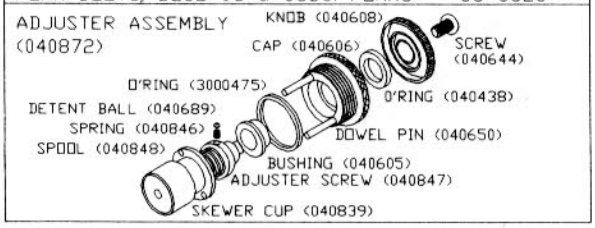


TABLE 2: CROWN/STEERER ASSEMBLY GUIDE

STEER TUBE LENGTH	STEER TUBE DIAMETER: 1.000 IN (25.4 MM) STANDARD	1.125 IN (28.6 MM) OVERSIZE	1.250 IN (31.8 MM) EVOLUTION
5.5 IN (140 MM)	85-3440	85-3450	85-3460
6.5 IN (165 MM)	85-3441	85-3451	85-3461
7.5 IN (190 MM)	85-3442	85-3452	85-3462
8.5 IN (216 MM)	85-3443	85-3453	85-3463
12.0 IN CM (305 MM) THREADLESS	85-3445	85-3414	85-3464
12.0 IN AL (305 MM) THREADLESS		85-3456	85-3466

CROWN/STEERER ASSEMBLY

FITS ALL 93 & SUBSEQUENT FORK MODELS (INCLUDES ALL PARTS SHOWN)

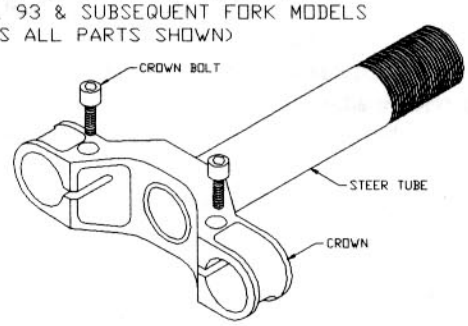


FIGURE 4: MANITOU 4 FORK SCHEMATIC

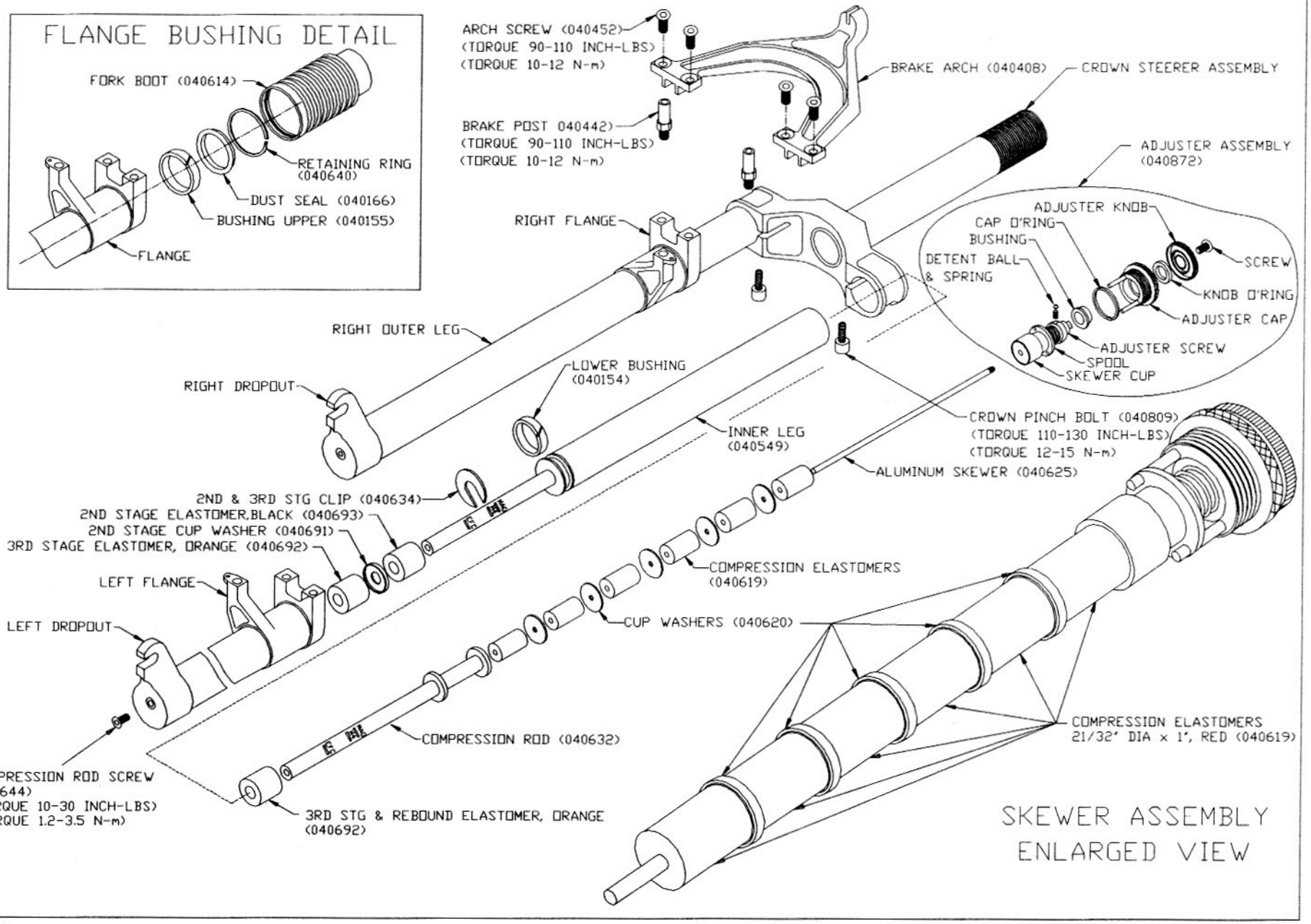
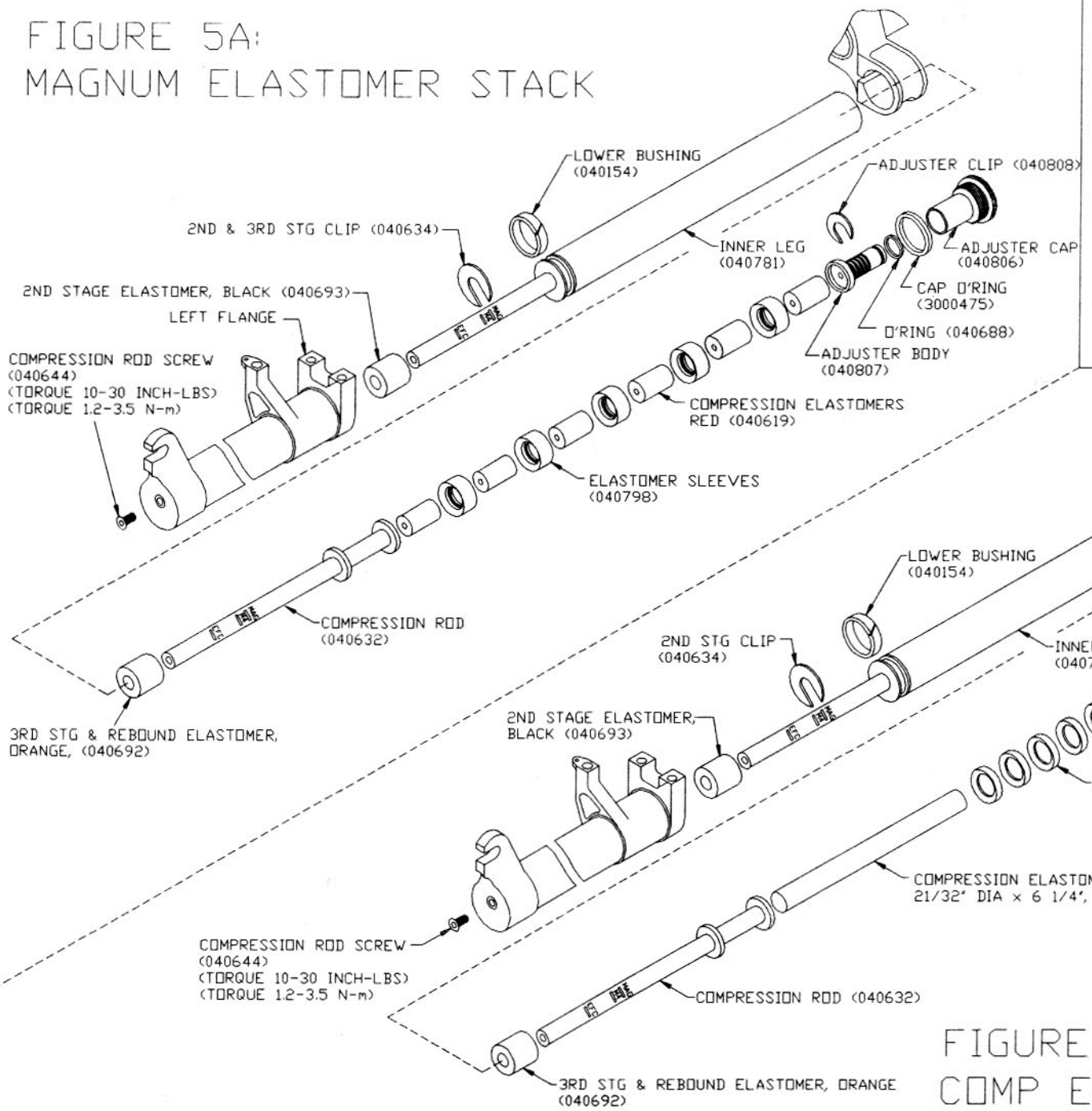


FIGURE 5A:
MAGNUM ELASTOMER STACK



FLANGE BUSHING DETAIL
MAGNUM & COMP

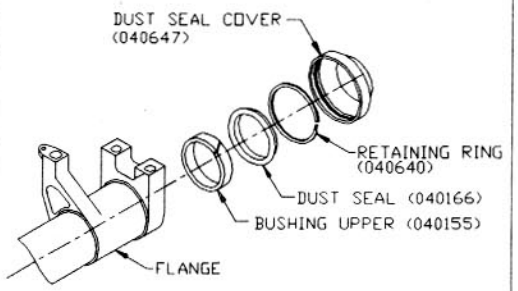


FIGURE 5B:
COMP ELASTOMER STACK

MAINTENANCE

NOTE: The Manitou should not be used if any parts appear to be or are damaged. Contact your local dealer or Answer Products for replacement parts.

Your Manitou Fork is nearly maintenance free. However, moisture and contamination may build up inside the fork. Although this may not affect the performance of the Manitou, to insure long life it is recommended that the fork be periodically disassembled, cleaned, dried and re-greased. When cleaning the fork, it is **NOT RECOMMENDED** to direct water spray at the seals.

Before every ride you should:

1. Ensure that quick release skewers are properly adjusted and tight.
2. Wipe the inner legs clean & check entire fork for any obvious damage.
3. Check tightness of front wheel quick release.
4. Check headset slack.
5. Insure that the front brake cable is properly seated in the cable retainer & check brake adjustment

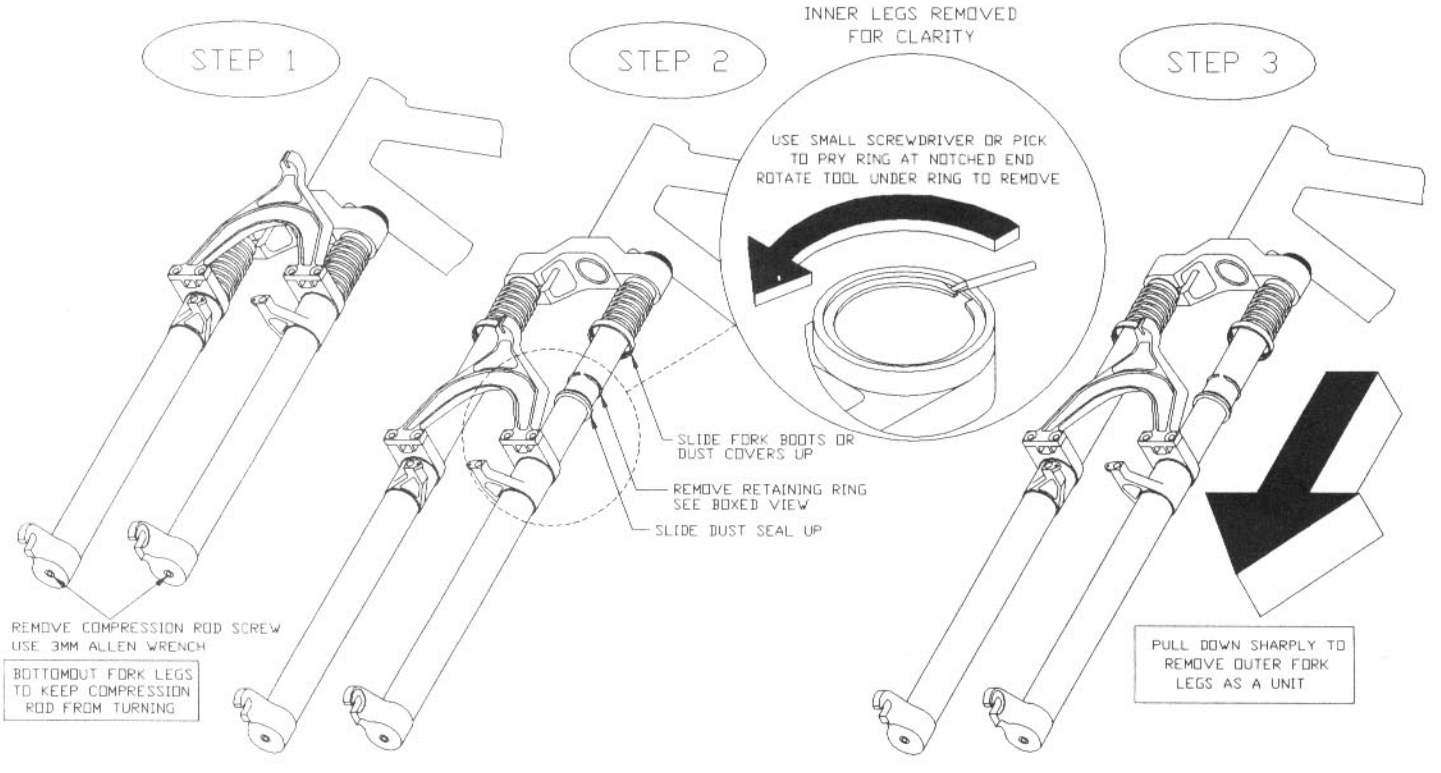
GENERAL DISASSEMBLY

NOTE: The cantilever brakes, brake arch, and inner legs DO NOT need to be removed for general disassembly or cleaning. We recommend you AVOID DISASSEMBLING these components unless absolutely necessary. Fork crown and inner legs may be left installed on bicycle during disassembly. It is also not necessary to disassemble the 95 Manitou Forks for compression elastomer replacement. Elastomer replacement is accomplished by removing the adjuster assembly per figure 7

Removal of outer legs Figure 6:

1. Remove both 5MM lower compression rod screws. Bottom out fork to prevent the compression rod from turning while removing screws. Pull outer legs down gently to get more room to work with the seal.
2. Lift fork boots or dust seal cover off of flange boss and slide it up inner fork leg.
3. Use a small screwdriver or point tool to remove retaining ring (Figure 6).
4. Pry up dust seal until it is above flange.
5. Pull outer leg assembly down sharply to force upper bushing out of the flange. It maybe necessary to pull several times before upper bushings pops out of the flange.

FIGURE 6: FORK DISASSEMBLY



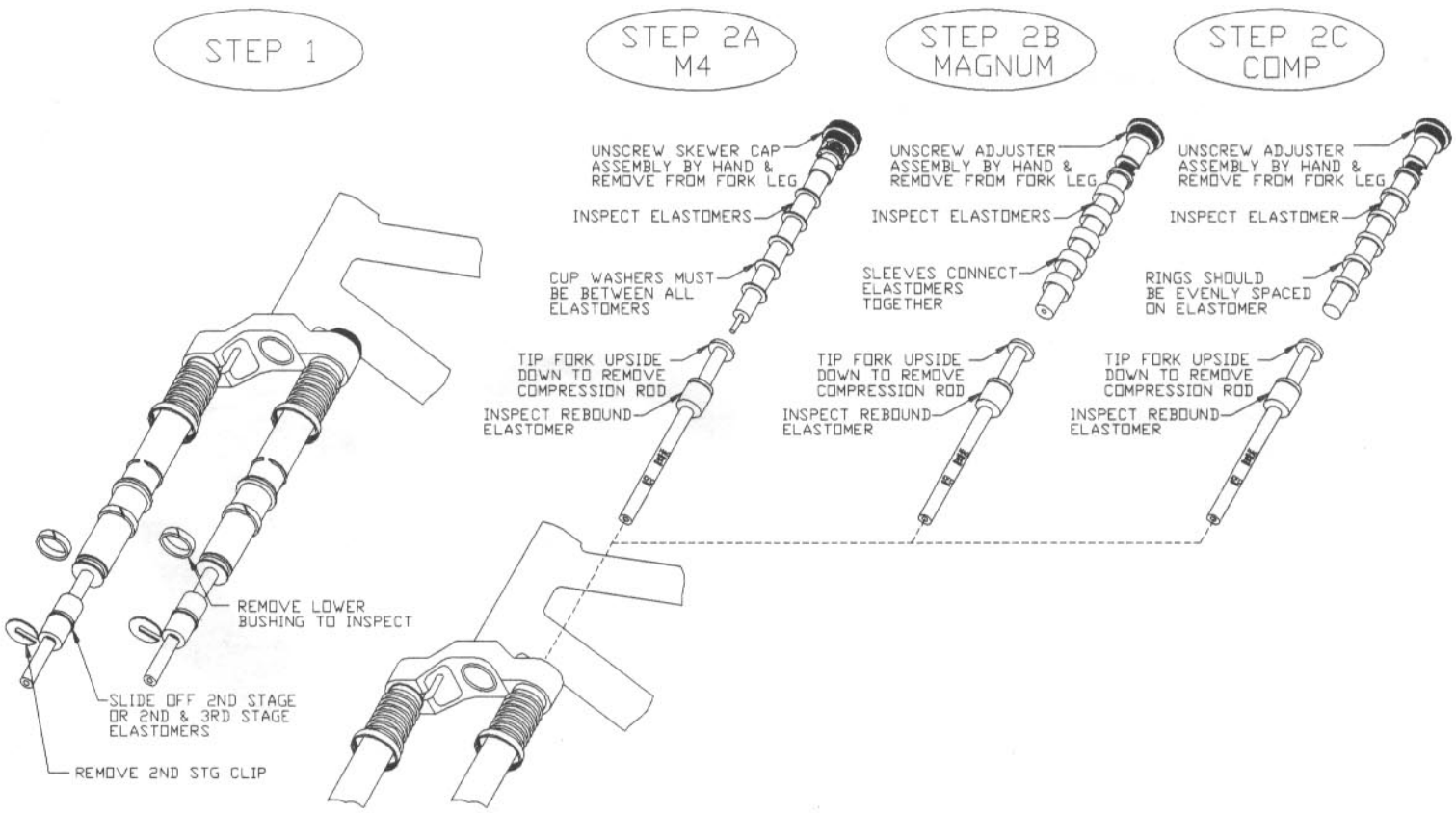
Skewer & Compression Rod Removal Figure 7:

1. Remove 2nd stage clip from the groove in compression rods.
2. Slide off the second stage elastomers.
3. Unscrew and remove the adjuster assemblies by hand.
4. Turn fork upside down to remove the compression rods. Giving the rods a quick upward thrust and catching them works also.
5. Remove the lower bushing if desired.

INSPECTION

1. Check the dust boots or the dust seal covers for tears, wear through or obvious damage.
2. Check the dust seal for tears or damage. Replace if needed.
3. Inspect the lower and upper bushing for excessive wear or damage. Checking the drag between the lower bushing installed on the inner leg and the outer leg and then separately the upper bushing installed in the flange and the inner leg is a good indication of wear. Drag should be very slight, enough to hold the weight of the inner leg but not more. Replace if necessary.
4. Check all elastomers for splitting, cracks or other obvious damage. Replace if necessary.
5. Check the aluminum skewer for straightness. If bent beyond straightening replace (Manitou 4 only).
6. Check smooth action of the adjuster. Clean and re-grease threads if necessary (Manitou 4 only).
7. Check the adjuster clip and grooves in the adjuster body. Replace if bent or damaged (Magnum & Comp only).
8. Check the outer leg I.D. for deep gouges or dents. Replace if damaged.
9. Check the inner leg O.D. for deep gouges, check for other obvious damage. Minor wear resulting in color change is not detrimental to the hard anodized surface. Replace if needed.
8. Check compression rod 2nd stage clip grooves for damage. Replace if damaged.
9. Insure that 2nd stage clips are flat and tightly engage the compression rod groove. Replace if bent or loose on compression rod.

FIGURE 7: ELASTOMER & COMPRESSION ROD REMOVAL



REASSEMBLY

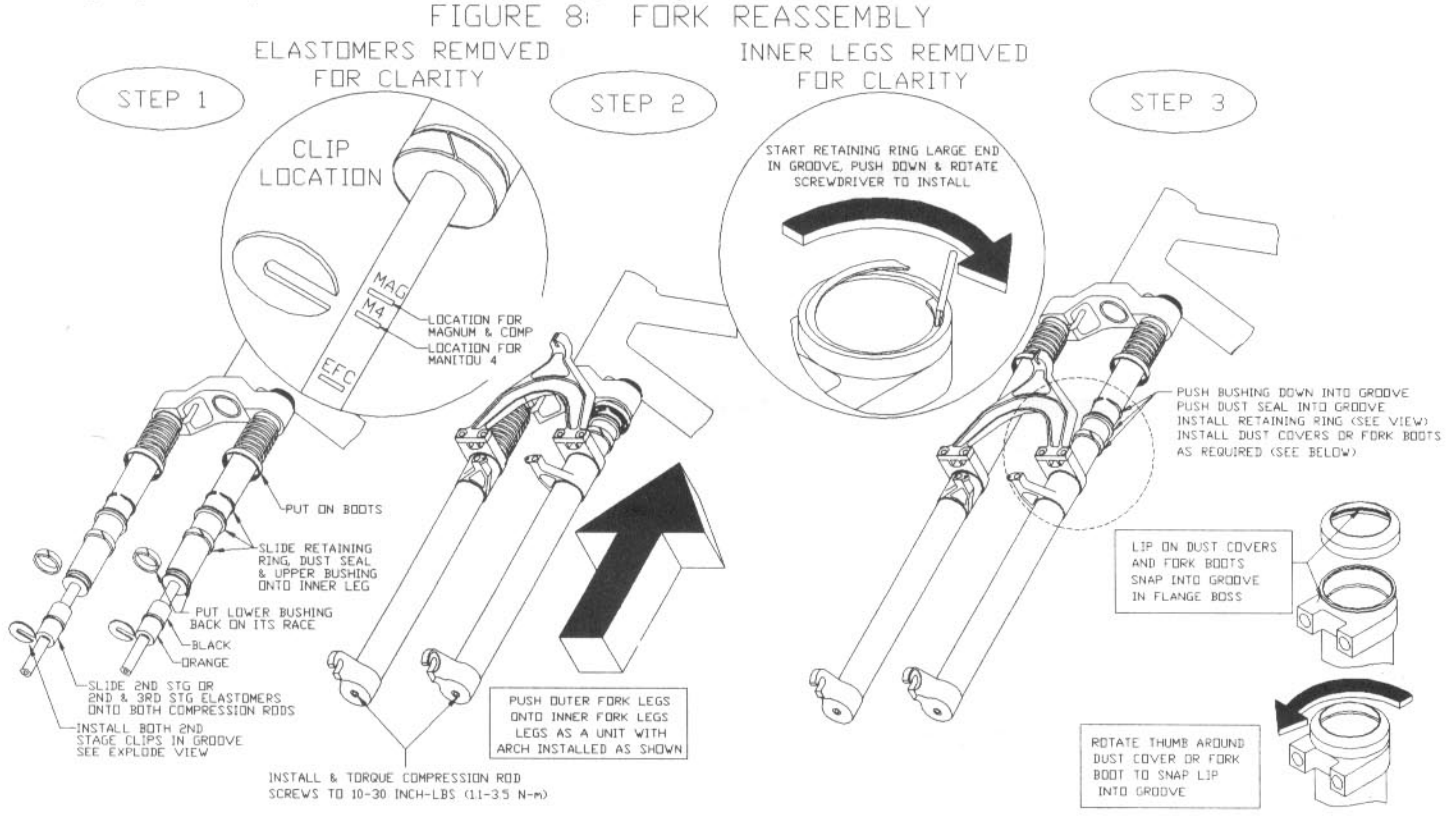
Compression Rod Installation Figure 7 & 8

1. Clean all parts thoroughly.
2. Slide fork boots or dust cover, dust seal, retaining ring, and upper bushing onto inner legs.
2. Grease Compression rods lightly.
3. Drop compression rods down into inner legs. Shake inner leg to get rod through inner leg plug.
4. Clean adjuster cap threads thoroughly. Grease threads on inside of inner leg.
5. Grease aluminum skewer and install desired compression elastomers. A cup washer must be between every elastomer (M4 only).
6. Back off adjusters to soft setting and install skewers assemblies into inner legs (M4 only).
7. Position adjuster clip in desired groove of adjuster body to set preload (Magnum & Comp).
8. Assemble elastomer and sleeves together, stick into adjuster body, and install elastomer stack into inner leg (Magnum only)
9. Slide elastomer rings onto one piece elastomer. Rings should be evenly spaced on the elastomer (Comp only).
10. Slide on 3/4" black second stage elastomers until just past clip groove.
11. Slide on 2nd stage cup washer and orange 3rd stage elastomer just past clip groove (M4 only).
12. Install 2nd stage clip. **Note: The grooves are marked, see view figure 8. Use the top groove for Magnum and Comp and the middle groove for M4. The clip must be in the proper groove to avoid bottoming the tire on the crown. Riding with the clip missing or in the wrong groove is unsafe.**
13. Grease and install lower bushing on inner leg plug.

Outer leg Installation Figure 8

1. Install outer legs as a unit onto inner legs. Force lower bushings past flange area until dropouts contact compression rods.
2. Install and torque both 5MM compression rod screws to 10-30 inch-lb. (1.1-3.5 N-m).
3. Using a screwdriver like tool push the upper bushing into the flange. Talk care not to damage bushing or scratch the inner leg.
4. Using similar tool push the dust seal down into its cavity.
5. Install retaining ring by starting the wide end in the flange groove. Pushing down with a screwdriver, rotate to feed ring into the groove, see figure 8 view). Install the ring so the end gap is oriented straight back. This will leave ring in the best position for removal later.
6. Slide fork boots or dust seal covers down inner fork leg onto the flange boss. Be sure the lip snaps into the groove in the flange boss.
7. Readjust preload adjuster knobs to desired preload (M4 only).

FIGURE 8: FORK REASSEMBLY



BRAKE ARCH

NOTE: All 95 Manitou fork brake arches are interchangeable, but are not interchangeable with 1992 M1 & M-Sport.

Removal:

1. Disconnect the cantilever brake cable from the brake retainer on the arch.
2. Remove the four 6MM allen screws.
3. Remove arch.

Reassembly:

1. Clean all mating surfaces and threads.
2. Install arch onto flanges
3. Install four 6MM allen screws.
4. Torque 6MM allen screws to 90-110 inch-lb. (10-12 N-m).
5. Replace cantilever brake cable in brake retainer.

INNER FORK LEGS Figure 9

During normal maintenance the inner fork legs do not need to be removed from the crown. It is recommended that the torque joints be left undisturbed.

Disassembly:

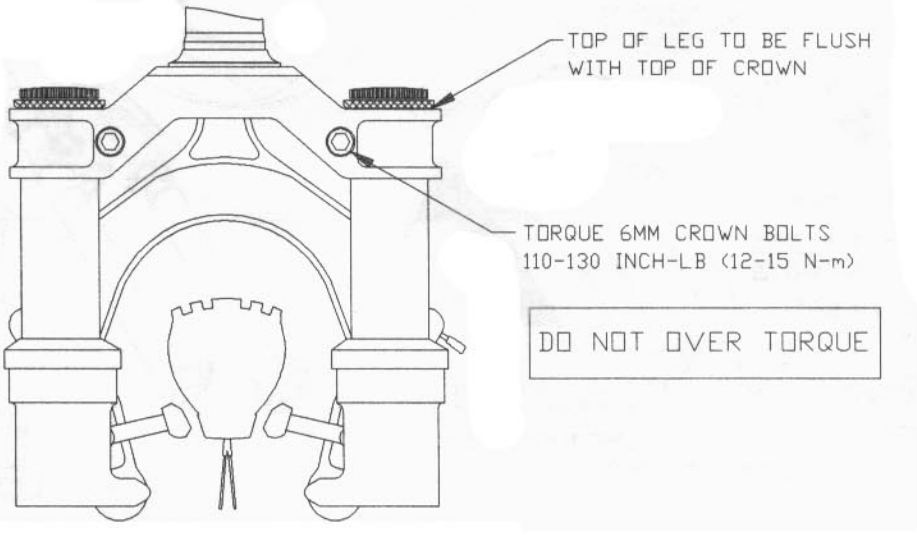
1. Loosen the two 6MM allen screws located in the crown.
2. Remove adjuster assemblies.
3. With twisting movement remove the inner fork legs.

Reassembly:

1. Clean mating surfaces of crown and inner fork legs.
2. Install inner fork legs into crown so top of leg is flush with crown surface.
3. Install adjuster assemblies until hand tight.
4. Tighten and torque two 6MM allen bolts to 110-130 inch-lb. (12-15 N-m).
5. Inspect to verify minimum clearance between tire and crown per figure 3, page 3.

WARNING: Do not over tighten or under tighten crown pinch bolts. Tighten only to 110-130 inch-lb. (12-15 N-m) . Over tightening may collapse inner legs and bind skewer threads. Under tightening may cause legs to slip in crown.

FIGURE 9: CROWN BOLT TORQUEING



ADJUSTING RIDE QUALITIES Figures 10, 11, & 12

Manitou forks offer a wide adjustment range to suit individual riding preference and rider weight by simply changing the urethane elastomers. Fine tune adjustments can be made using the preload adjusters located on top of the fork crown. Each production fork comes with an all red compression stack appropriate for an aggressive rider of 155-180 lb. Softer, blue and harder, yellow elastomers are available from your authorized Manitou Dealer..

Fine Tuning M4:

Fine tuning adjustments can be made by rotating the adjuster knobs located on top of the crown. Rotating the knob clockwise will firm the ride adding preload to the compression stack. This will firm initial travel for small bumps but will not limit the full travel for larger bumps. Rotating the knobs counter clockwise will soften the ride. Five revolutions of the adjuster knob will take the adjuster from full soft to the extreme firm ride setting changing the preload by 1/2 inch (12.7MM). It is not necessary to have the right and left adjusters set exactly the same.

Fine Tuning Magnum & Comp:

Fine tuning adjustments are made by removing the adjuster assembly, removing the adjuster clip and replacing it in a different groove. The groove closest to the top is the softens setting, while the groove closest to the bottom provides maximum preload and is the most firm setting.

Elastomer Replacement Tuning:

Normal riding should result in 2 1/4" travel for the M4, 2" travel for Magnum, and 1 7/8" travel for Comp. Large hits should use full travel. An excessively soft compression stack will rely too heavily on the second stage elastomer. A mushy feel with frequent noticeable bottoming will occur. A excessively firm compression stack will not use full travel. If your forks are too soft or too firm and need elastomer replacement remove the adjuster assemblies, replace the elastomers and ride test. Disassembly of the fork is not required. In addition to the replacement elastomers provided with the M4 fork, an expanded soft ride and firm ride kit are available through your dealer as an accessory. The soft ride kit is a complete set of blue compression elastomers and the firm ride kit is a complete set of yellow compression elastomers. For the M4 and the Magnum any combination of colors can be used to obtain the ride that suits your preference, although it is not recommended to use a soft elastomer like blue in a stack of hard elastomers like yellow. The soft elastomer will be overpowered by the firm ones.

Manitou forks may become firm in cold weather, temperatures below 45 F (7 C). Although the elastomer spring rate does not change dramatically with temperature, the resilience and the ability of the elastomer to "bounce" does change. Cold ride kits are available for all the 95 Manitou Fork models. The spring rate of the cold ride kit is similar to the stock ride, however the elastomer has been developed to remain active even in the colder temperatures.

FIGURE 10: FINE TUNING MANITOU 4

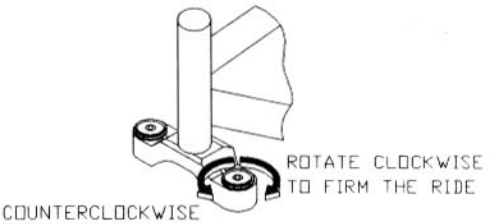


FIGURE 11: FINE TUNING MAGNUM & COMP

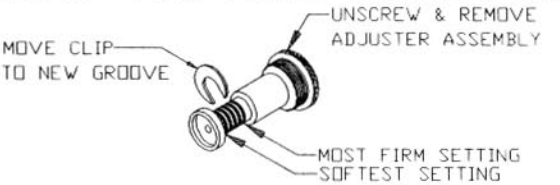


FIGURE 12: ZIP-TIE TRAVEL INDICATOR

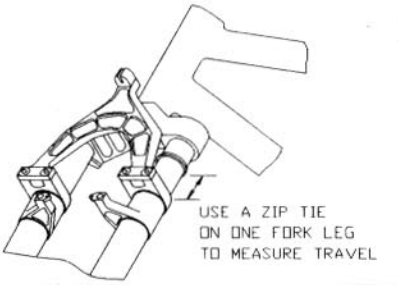


TABLE 3: ELASTOMER RIDE KITS, M4 & MAGNUM			
COLOR	STIFFNESS	RIDE KIT	PART NO.
BLUE	SOFT	SOFT RIDE	85-3503
RED	MEDIUM		040619
YELLOW	FIRM	FIRM RIDE	85-3504
BROWN	EXTRA FIRM	EXTRA FIRM	85-3524
GREEN	MEDIUM	COLD RIDE	85-3519
MANITOU 3 & 4 CUP WASHERS			040620
MAGNUM ELASTOMER SLEEVES			040798
M4 & MAGNUM REBOUND ELASTOMER			040692
M4 & MAGNUM 2ND STAGE ELAST			040693
M4 3RD STG ELASTOMER			040692
M4 2ND & 3RD STG CUP WASHER			040691

TABLE 4: ELASTOMER RIDE KITS, COMP			
COLOR	STIFFNESS	RIDE KIT	PART NO.
BLUE	SOFT	SOFT RIDE	85-3528
RED	MEDIUM		040703
GREEN	MEDIUM	COLD RIDE	85-3530
COMP ELASTOMER RINGS			040799
COMP REBOUND ELASTOMER			040692
COMP 2ND STAGE ELASTOMER			040693

TROUBLE SHOOTING

The adjuster knob is locked and will not turn:
The adjuster is probably at one extreme end of the travel. Unscrew the skewer cap assembly and remove the skewer to see if the adjuster is at the extreme firm or soft end of its travel. The spool will almost be off of the two dowel pins at the extreme firm setting. Unlock the knob by rotating it clockwise, if at the extreme soft setting, or counter clockwise, if at the extreme firm setting.

Fork seems to "top out" or has a slight clunking feel when front wheel comes off the ground:
Excessive preload will result in a "top out" if the adjuster is at the extreme firm setting. Selecting elastomers with that better fit your weight and riding style and having the adjuster set mid range will eliminate "top out". Also if you have converted your fork to long travel and removed both top out elastomers then the fork will clunk at the top. Disassemble per instructions and put one top out elastomer back in.

The fork feels less active and is not getting the travel it used to when it was new:
Chances are that the fork is developing stiction. Greasing the skewer so the elastomers slide easily will help. Complete disassembly, cleaning, and re-greasing is also recommended periodically especially after mud rides. This will keep the fork in good shape and working like new. **Note: If you ride in wet or muddy conditions it is recommended that you use fork boots to keep you fork clean and working like new.**

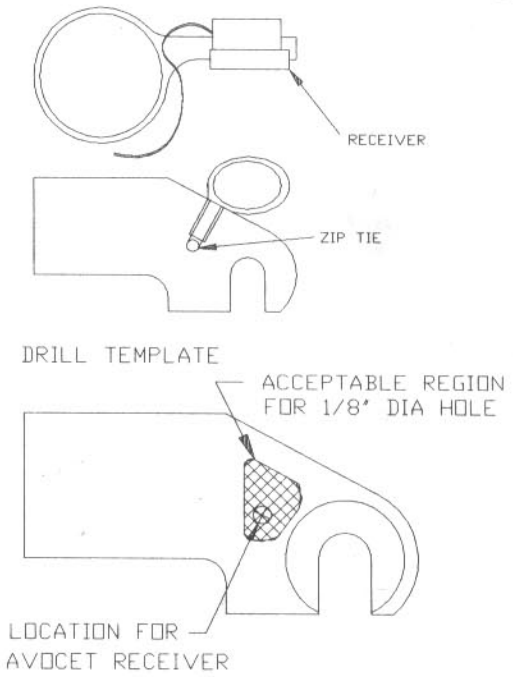
Outer legs feel loose on inner legs and bushings, a knock or rock can be felt when pushed from side to side:
Either the lower bushing is missing or worn out. Disassemble per instructions, check both the upper and lower bushings for excessive damage and replace if necessary. Clean, grease, and reassemble.

CYCLE COMPUTER INSTALLATION INSTRUCTIONS Figure13

Follow the instructions in your owners manual with the following exceptions:

1. Remove the front wheel and locate the receiver on the top of the right dropout.
2. Use the template to locate any holes drilled in the dropout in the acceptable region.
3. Use a center punch or nail to punch mark the location of the hole in the right dropout.
4. Drill 1/8" dia. hole through the dropout.
5. Attach the receiver to the dropout by passing a zip tie through the hole and the receiver and tighten it securely (see sketch).
6. Attach the wire to the wheel side of the fork leg using zip ties or a strip of electrician's tape. Wind the wire around the brake arch and then the front brake cable casing on its path up to the handlebar mount. Do not attach the wire to the bicycle frame or any other part that does not turn with the handlebar and fork. Doing so will reduce the life span of the wire.

FIGURE 13: CYCLE COMPUTER MOUNTING



Note: The drill template shows the acceptable region to drill a 1/8" (3MM) dia. hole through the dropout. Drilling in other areas could damage the dropout and render that fork unsafe to use. The template also shows the recommended location for the Avocet receiver. Use the newer Avocet adjustable receiver identified by its lateral ratchet slider. Old Avocet receivers are fixed position and will not perform correctly on the Manitou Fork.